

Work Order ID 86987

Friday, July 06, 2012 3:10:39 PM

86987

Page 1

Item ID: D350-748-241TRN

Accept

N900040100

Setup Start ***NS1***

Revision ID:

Item Name: Crosstube Turning Detail

Stop ***NS2***

Start Date: 7/6/2012 Start Qty: 1.00

1

Cust Item ID:

Required Date: 7/12/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: *mf*

Date: *12-07-06* Tooling:

Date:

Run Start ***NR1***

QC:

Date: SPC (Y/N):

Date:

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr

Revision Nbr

D350-748-241

F

100

0.00

100

MORI SEIKI CNC LATHE LARGE

Mori Seiki

Memo

0.00

Mori Seiki CNC Lathe Large

1-Fill tube with sand & install plugs on both ends as per Folio FA647

2-Turn first side as per Folio FA647

3- File transition lines smooth.

FOLIO REV: _____

DWG REV: *F*

110

QC1- Inspect dimensions to dimension sheet

0.00

110

QC

Memo

0.00

Quality Control

mm L
12/07/11

mm L
12/07/11

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

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Page 2

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Start Date: 7/6/2012 Start Qty: 1.00

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Required Date: 7/12/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start ***NR1***

QC:

Date:

SPC (Y/N):

Date:

Stop ***NR2***Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursTool ID Tool # Plan
Code Accept Reject Reject Insp.
Qty Qty Number Stamp

120

0.00

120

MORI SEIKI CNC LATHE LARGE

Mori Seiki

Memo

0.00

Mori Seiki CNC Lathe Large

1-Turn second side as per Folio FA647
2- File transition lines smooth.
3-Scribe part # as per Dwg D350-748-241
FOLIO REV: F
DWG REV: F 1 / ϕ KC -12-7-12

130

QC1- Inspect dimensions to dimension sheet

0.00

130

QC

Memo

0.00

Quality Control

1 / ϕ KC 12-7-12

140

QC8- Inspect parts - second check

0.00

140

QC

Memo

0.00

Quality Control

SOS
12-7-23

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Required Date: 7/12/2012 Req'd Qty: 1.00 ***1***

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Reference:

Approvals:	Process Plan:	Date:	Tooling:	Date:	Run	Start	*NR1*
	QC:	Date:	SPC (Y/N):	Date:		Stop	*NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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150

0.00

150

Large Fab

Crosstubes

Memo

0.00

Crosstubes

1-DRILL HOLES FOR HEAT TREAT USING DT9806(HOLES MUST BE
ALIGNED ON SAME LINE ON BOTH CUFFS)

- DC 12/07/24

2-Grind machining marks

RM

12-7-27

160

0.00

160

Outsource1

Outsource process - Heat Treat

Memo

0.00

Outsource process - Heat Treat

Issue P/O: 17601
Heat Treat to min 180 KSI As per Dwg D350-748-241
Sand Blast tube after Heat Treat
Possible Supplier: Vac Aero
Ensure Certificate of Conformity is attached

R1208-2

PTD

170

0.00

170

Packaging

Receive & Inspect for Damage & Mat'l Certs

Memo

0.00

Packaging

Ensure certificate of conformaty is attached

IX.

12-8-21

12-8-21

W/O: 86987		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

See Part 12-1915

Part No: D350-748-241TRN PAR #: _____ Fault Category: _____ NCR: Yes No DQA: [Signature] Date: 12/10/17

Resolution: _____ Disposition: _____ QA: N/C Closed: [Signature] Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
12/09/21	N60	Supplier did not standardize our PO 17601	W 12/09/21	send for standardizing to remove scale only Issue PO 17979 FMI	12/10/17	DAS 16 12/10/15	W 12/09/21	DAS 16 12/10/15
		RC: Poor Communication		receive & inspect	12/17/17 (1)			

NOTE: Date & initial all entries

Work Order ID 86987***86987***

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Friday, July 06, 2012 3:10:39 PM

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Required Date: 7/12/2012 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: Date:

Tooling: Date:

Run Start ***NR1***

QC: Date:

SPC (Y/N): Date:

Stop ***NR2***Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

180

QC6- Inspect dimensions to drawing

0.00

180

QC

Memo

0.00

Quality Control

190

Packaging

0.00

190

Packaging

Memo

0.00

Packaging

Identify and stock in kanban rack
Location: LG

200

QC21- Final Inspection - Work Order Release

0.00

200

QC

Memo

0.00

Quality Control

12/10/15

12-10-15

W/O:		WORK ORDER CHANGES					
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Picklist Print

Friday, July 06, 2012 3:10:38 PM

Page 1

Work Order ID: 86987

Parent Item: D350-748-241TRN

Parent Item Name: Crosstube Turning Detail

Start Date: 7/6/2012

Required Date: 7/12/2012

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:A New Issue 08-03-06 DD verified by:ec
IPP Rev B Removed polish 08.04.02 EC verified by : DD
IPP Rev C Removed LPS-3 08.06.23 Ec verified by: DD IPP Rev D 11.02.24 as per dwg
rev.F DD verf: JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6015-125 Crosstube Material		Manufactured	No			120	Each	28.0000	1	1			

Location

Loc Qty

Loc Code

HALL

28

61380

4

72511

24

man, l 12/07/06

W/O:		WORK ORDER CHANGES					
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NOTE: Date & initial all entries

DART AEROSPACE LTD		Work Order: 86287
Description: Crosstube Assembly (AS350/355 High Aft)		Part Number: D350-748-241
Inspection Dwg: D350-748-241 Rev: F		Page 1 of 2

FIRST ARTICLE INSPECTION CHECKLIST

	Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.240	+0.005/-0.000	2.243	✓		VERN	CNC-08
	2.180	+0.005/-0.000	2.184	✓			
	2.180	+0.005/-0.000	2.185	✓			
	2.208	+0.005/-0.000	2.213	✓			
	2.234	+0.005/-0.000	2.235	✓			
	2.253	+0.005/-0.000	2.256	✓			
	2.272	+0.005/-0.000	2.277	✓			
	2.299	+0.005/-0.000	2.306	✓			
	0.063	+/-0.010	.063	✓		VERN	
	4.26	+/-0.030	4.26	✓		VERN	
	R0.063	+/-0.010	.063	✓		R6	
	R0.50	+/-0.030	.50	✓		R6	
SIDE B	2.240	+0.005/-0.000	2.239	✓		VERN	CNC-08
	2.180	+0.005/-0.000	2.180	✓			
	2.180	+0.005/-0.000	2.180	✓			
	2.208	+0.005/-0.000	2.203	✓			
	2.234	+0.005/-0.000	2.226	✗			
	2.253	+0.005/-0.000	2.257	✓			
	2.272	+0.005/-0.000	2.277	✓			
	2.299	+0.005/-0.000	2.306	✓			
	0.063	+/-0.010	.063	✓			
	4.26	+/-0.030	4.26	✓			
	R0.063	+/-0.010	.063	✓		R6	
	R0.50	+/-0.030	.50	✓		R6	
	122.70	+/-0.060	122.70	✓		TAPE	L6-22

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

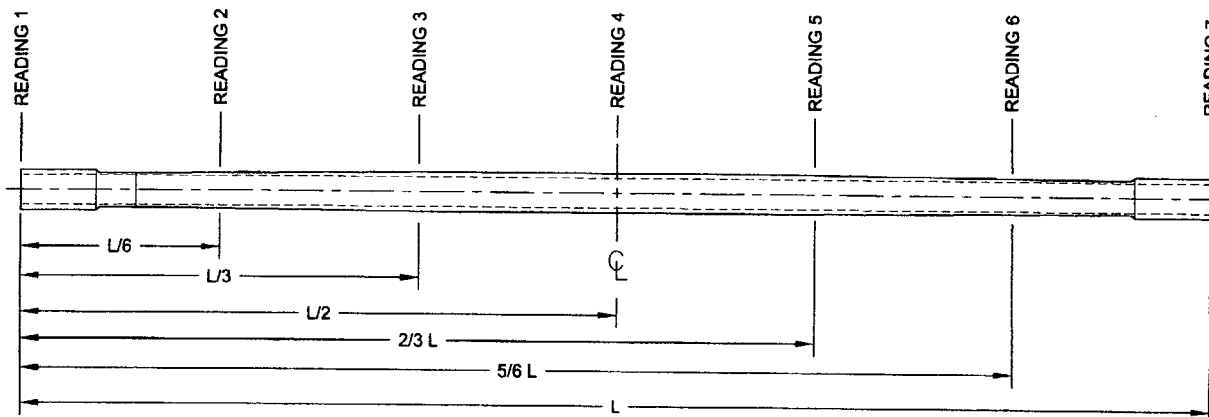
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order: 86987
Description: Crosstube Assembly (AS350/355 High Aft)	Part Number: D350-748-241
Inspection Dwg: D350-748-241 Rev: F	Page 2 of 2

WALL THICKNESS MEASUREMENT



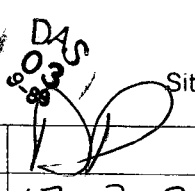
Location	WALL THICKNESS MEASUREMENT (IN)				Deviation Δw (max-min)	TOLERANCE
	w1	w2	w3	w4		
READING 1 L= 0"	.129	.124	.120	.130	.010	0.030"
READING 2 L= 20.5	.122	.123	.103	.116	.020	
READING 3 L= 41	.151 .161	.159	.152	.151	.010	
READING 4 L= 61.5	.159	.155	.156	.158	.004	
READING 5 L=	.148	.143	.161	.165	.022	
READING 6 L=	.109	.108	.128	.128	.02	
READING 7 L=	.122	.129	.141	.146	.024	

Calibration Result

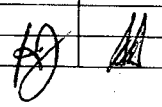
Actual Block Thickness: 100-200

Sitiescan 250 Measured Thickness: 100-200

Measured by: KC
Date: 12-7-12

Audited by: 
Date: 12-7-23

Preliminary Approval:
Date:

Rev	Date	Change	Revised by	Approved
A	07.01.17	New Issue (P/O D350-748-201)	KJ/JLM	
B	12.02.02	Dwg Rev updated	KJ	
C	12.06.04	Wall thickness form added	KJ	

W/O:		WORK ORDER CHANGES					
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NOTE: Date & initial all entries

Item	Qty -241	Part Number	Description
1	X	D350-748-241	CROSSTUBE ASSEMBLY (AS 350/355 HI AFT)
2	1	D6015-125	CROSSTUBE (OR D6018-125)
3	2	D3502-1	SUPPORT
4	2	D2856-400-710	ABRASION STRIP
5	1	AELS-1032-225	INSERT
6	1	NAS1149D0363J	WASHER (OR AN960JD10)
7	2	MS21920-20	CLAMP (PER DART SPEC. M-MS21920-20)
8	1	MS27039-1-10	SCREW

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6015-125 OR D6018-125
FINISHED LENGTH = 122.700±0.06
- 2) FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2
CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: DART PART NUMBER "D350-748-241" AND BATCH NUMBER ON INSIDE OF CUFF
PER DART QSI 044 6.4 (VIBRATING STYLUS)
- 7) WEIGHT: 29.85 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.297 HOLE.
- 9) RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT ALL EDGES FROM MACHINING
LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH. NOTE: ALL HOLES ARE DRILLED AFTER
BENDING.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES. MAXIMUM TUBE FLATTENING DUE TO
BENDING IS 6% BASED ON O.D.
- 11) HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS 2759-1C AFTER TURNING. ACCEPTABLE TO
VERIFY TENSILE STRENGTH BY HARDNESS TEST PER ASTM E18 TO 40-45 HRC.
- 12) INSTALL D2856-400-710 ABRASION STRIPS WITH A GAP ON BOTTOM SIDE OF CROSSTUBE,
CENTERED OPPOSITE D3502-1 SUPPORT, PER QSI 035.
- 13) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES,
NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY.
CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE
MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO
CRACKING/CHIPPING/GROOVES.
- 14) TORQUE CLAMPS 60 TO 80 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT
NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.
- 15) MAX TWIST AFTER BENDING: WITH XTUBE LAYED FLAT ON SURFACE, THE DIFFERENCE BETWEEN
CUFF HEIGHTS FROM THE SURFACE MAY BE NO LARGER THAN 0.25 (ZN C1-3).

RELEASED
R 2011-01-08

F	ADD HRC TEST OPTION (B8-1) PER PAR 09-040, ADD TWIST LIMIT (A8-1, C1-3), ADD D6015-125 OPTION (C8-1), STOCK DIM NOW MACHINED (D1-4)	CP	10.11.23
E	REVISE GENERAL NOTES; UPDATE TO CURRENT STANDARDS; RELOCATED FLAG #6 PER PAR 08-046 (ZN A8-3); ADD TOLERANCES (ZN C6-3, D2-3)	RF	09.09.30
D	MAG. PARTICLE AND CAD PLATE AS MFD.	CP	06.10.31
C	ADD CAD PLATING	CP	06.08.14
B	ADD D6018-125 & PRIME AND PAINT	CP	06.06.30
A	NEW ISSUE	CP	06.03.31
REV.	DESCRIPTION	BY	DATE
DESIGN			
DRAWN			
CHECKED			
MFG. APPR.			
APPROVED			
DE APPR.			
DATE	10.11.23		

DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWING NO. D350-748-241	REV. F SHEET 1 OF 4
TITLE CROSSTUBE (AS 350/355 HI AFT)	SCALE NTS
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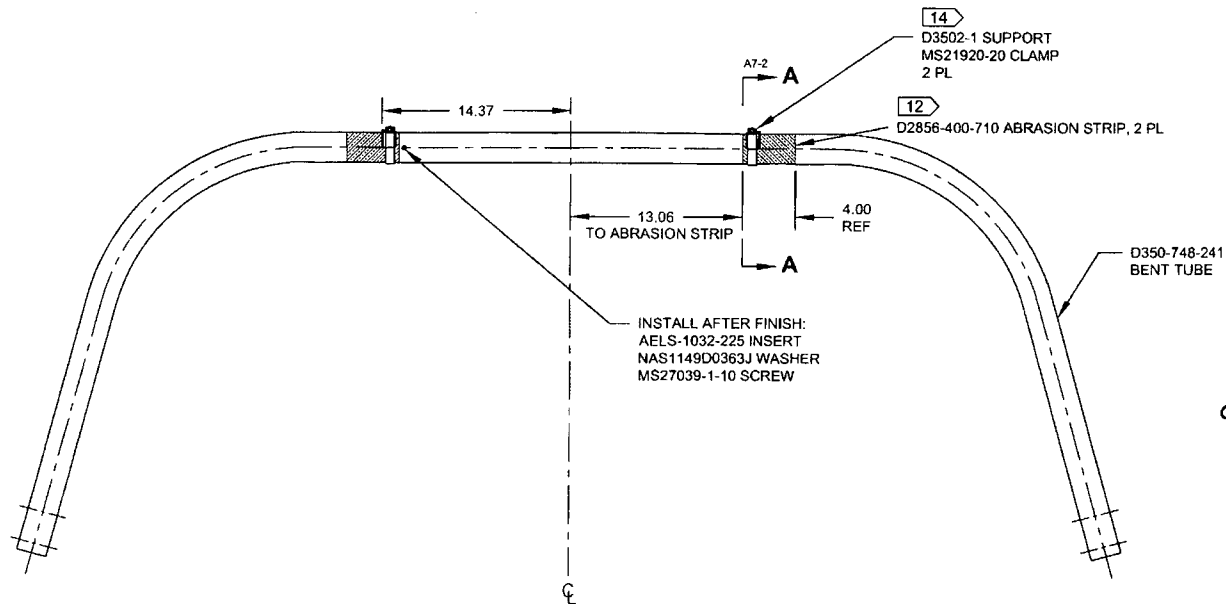
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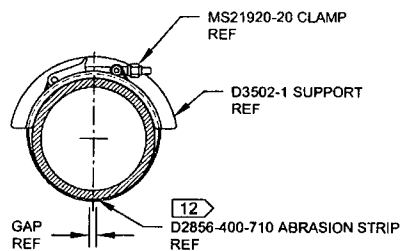
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86987

**D350-748-241
ASSEMBLY DETAIL**



SECTION A-A D4-2
SCALE 4X

RELEASED
2011-05-19

DESIGN	90	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	90	DRAWING NO.	REV. F
CHECKED	90	D350-748-241	SHEET 2 OF 4
MFG. APPR.	90	TITLE	SCALE
APPROVED	90	CROSSTUBE (AS 350/355 HI AFT)	NTS
DE APPR.	90	COPYRIGHT © 2006 BY DART AEROSPACE LTD	
DATE	10.11.23	THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COME OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

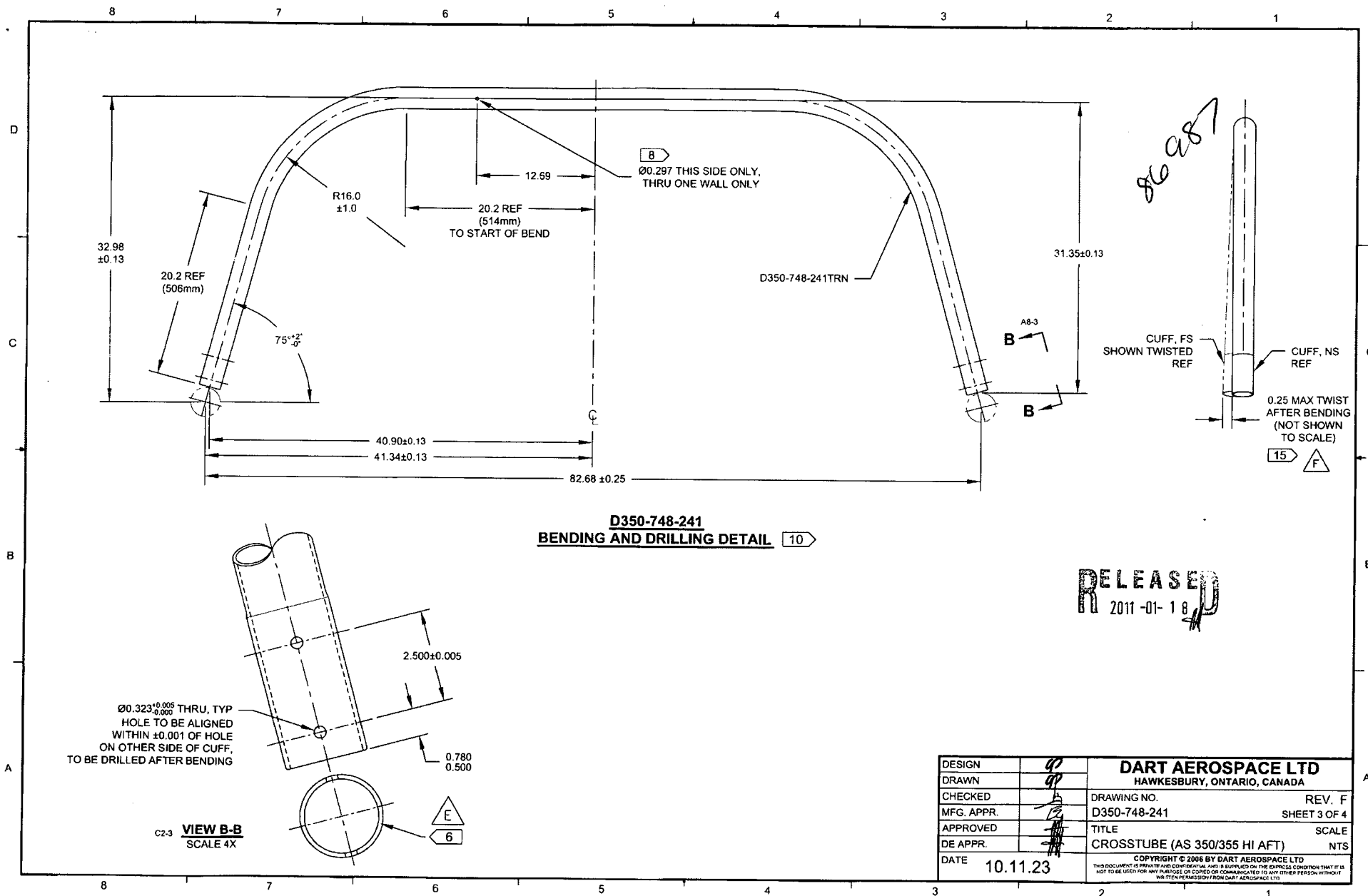
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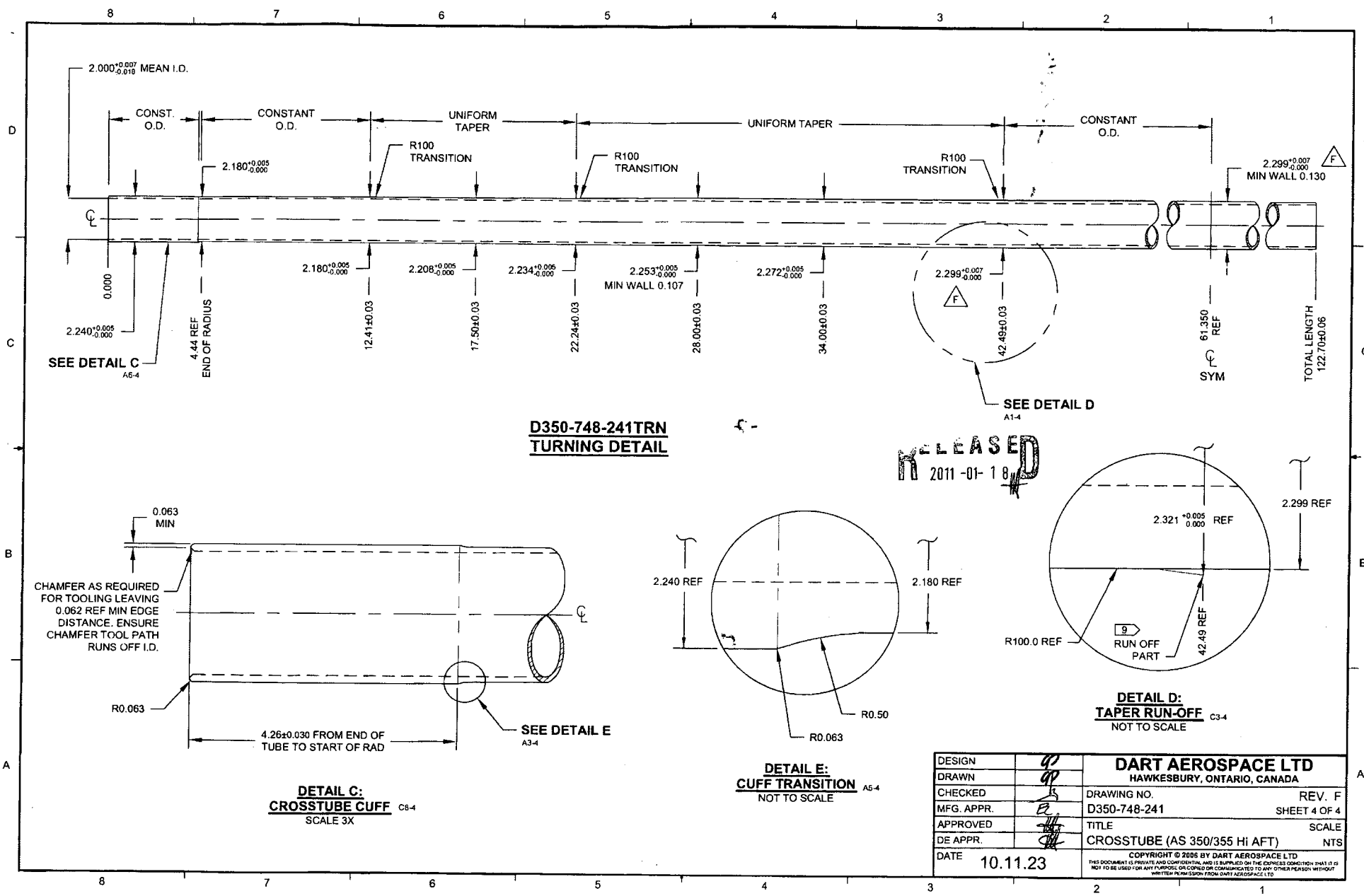
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DESIGN	40	DART AEROSPACE LTD	
DRAWN	40	HAWKESBURY, ONTARIO, CANADA	
CHECKED	40	DRAWING NO.	REV. F
MFG. APPR.	40	D350-748-241	SHEET 4 OF 4
APPROVED	40	TITLE	SCALE
DE APPR.	40	CROSSTUBE (AS 350/355 Hi AFT)	NTS
DATE	10.11.23	COPYRIGHT © 2005 BY DART AEROSPACE LTD	
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NOTE: Date & initial all entries

Packing I

Sales Order Num

7

Sales Order

Aug 8,

1

LAB

**1000 E. MERMAID LANE
WYNDMOOR, PA 19038**

Voice: 215-233-2600

Fax: 215-233-5653

Sold To:

**DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7**

Ship To:

**DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7**

Customer ID	PO Number	Payment Terms
DARA	PO17601	Net 30 Days
Ship Via	Process	
R & L CARRIER		

Quantity	Item	Description	Total Shipped	This Shipment
1.00	✓	1 PC. 86987 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		
1.00	✓	1 PC. 86988 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		
1.00	✓	1 PC. 84668 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		

SP 128-21

COMMENTS

SHIPPED BY, SIGNATURE
METLAB

DATE

RECEIVED BY, SIGNATURE
DART AEROSPACE

DATE

Packing I

Sales Order Number

7

Sales Order

Aug 8,

LAB

1000 E. MERMAID LANE
WYNDMOOR, PA 19038

Voice: 215-233-2600

Fax: 215-233-5653

Sold To:

DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7

Ship To:

DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7

Customer ID	PO Number	Payment Terms
DARA	PO17601	Net 30 Days
Ship Via	Process	
R & L CARRIER		

Quantity	Item	Description	Total Shipped	This Shipm
1.00	✓	1 PC. 84672 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		
1.00	✓	1 PC. 84669 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		
1.00	✓	1 PC. 84677 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT 180 POUNDS TOTAL		

SP 12-8-21

COMMENTS

SHIPPED BY, SIGNATURE
METLAB

DATE

RECEIVED BY, SIGNATURE
DART AEROSPACE

DATE



1000 E. Mermaid La., Wyndmoor (Phila.) PA 19038-8093
Tel. (215) 233-2600 Fax (215) 233-5653

Invoice

Invoice Num

0114

Invoice D

Aug 16, 20

Sold To:

DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7

Ship To:

DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7

Customer ID		Customer PO		Payment Terms	
DARA		PO17601		Net 30 Days	
Shop Order No.		Shipping Method		Ship Date	Due Date
73369		R & L CARRIER		8/16/12	9/15/12
Quantity	Item	Description		Unit Price	Extensio
1		1 PC. 86987 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		205.000	20
1		1 PC. 86988 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		205.000	20
1		1 PC. 84668 D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT		205.000	20
1		1 PC. 84672		205.000	20

ANY DISCREPANCIES MUST BE REPORTED WITHIN 10 DAYS AFTER RECEIPT.

We accept AMEX, Visa & Master Card



Heat Treating and Metallurgical Consulting

Subtotal	Contir
Shipping/Handling	
Total Invoice Amount	Contir
Payment Received	
TOTAL	Contir

Visit our Web Site: <www.thomasregister.com/metlab/>



1000 E. Mermaid La., Wyndmoor (Phila.) PA 19038-8093
Tel. (215) 233-2600 Fax (215) 233-5653

Invoice

Invoice Num

0114

Invoice D

Aug 16, 20

Sold To:

DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7

Ship To:

DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7

Customer ID		Customer PO		Payment Terms	
DARA		PO17601		Net 30 Days	
Shop Order No.		Shipping Method		Ship Date	Due Date
73369		R & L CARRIER		8/16/12	9/15/12
Quantity	Item	Description		Unit Price	Extensi
1		D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT 1 PC. 84669		205.000	20
1		D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT 1 PC. 84677		205.000	20
		D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMD 2759-1C) SANDBLAST TUBE AFTER HEAT TREAT 180 POUNDS TOTAL			

ANY DISCREPANCIES MUST BE REPORTED WITHIN 10 DAYS AFTER RECEIPT.

We accept AMEX, Visa & Master Card



Heat Treating and Metallurgical Consulting

Subtotal	1,23
Shipping/Handling	
Total Invoice Amount	1,23
Payment Received	
TOTAL	1,23

Visit our Web Site: <www.thomasregister.com/metlab/>

North American Free Trade Agreement Certificate of Origin

Please print or type

1. Exporter's Name and Address: Metlab 1000 E. Mermaid Lane Wyndmoor, PA 19038 Tax Identification Number: 23-2973306		2. Blanket Period: (dd/mm/yyyy) <div style="display: flex; justify-content: space-between;"> From: 01/01/2012 To: 31/12/2012 </div>				
3. Producer's Name and Address: Metlab 1000 E. Mermaid Lane Wyndmoor, PA 19038 Tax Identification Number: 23-2973306		4. Importer's Name and Address: Dart Aerospace 1270 Aberdeen Street Hawkesbury, ON K6A 1K7 CANADA Tax Identification Number:				
5. Description of Good(s) <div style="text-align: center; height: 150px;">Heat Treatment Services</div>	6. HS Tariff Classification Number <div style="text-align: center; height: 150px;">8483.401</div>	7. Preference Criterion <div style="text-align: center; height: 150px;">C</div>	8. Producer <div style="text-align: center; height: 150px;">Yes</div>	9. Net Cost <div style="text-align: center; height: 150px;">No</div>	10. Country of Origin <div style="text-align: center; height: 150px;">USA</div>	
11. I CERTIFY THAT: <ul style="list-style-type: none"> * the Information on this document is true and accurate and I assume the responsibility for proving such representations. I understand that I am liable for any false statements or material omissions made on or in connection with this document; * I agree to maintain, and present upon request, documentation necessary to support this Certificate, and to inform, in writing, all persons to whom the Certificate was given of any changes that would affect the accuracy or validity of this Certificate; * the goods originated in the territory of one or more of the Parties, and comply with the origin requirements specified for those goods in the North American Free Trade Agreement, and unless specifically exempted in Article 411 or Annex 401, there has been no further production or any other operation outside the territories of the Parties; and * this Certificate consists of <u>One (1)</u> page, including all attachments. 						
Authorized Signature: <div style="text-align: center; font-size: 2em;">MP</div>			Company: Metlab			
Name: Mark Podob			Title: Vice President			
Date: (mm/dd/yyyy) 8/16/2012	Telephone: 215-233-2600		Fax: 215-233-5653			



1000 E. Mermaid Ln., Wyndmoor (Phila.) PA 19038-8093
Tel. (215) 233-2600 Fax (215) 233-5663

ORDER ACKNOWLEDGEMENT

613 632 1053

E-MAILED TO: _____

FAXED TO: _____

QF-4.722-01

Rev A 5/10/10

CUSTOMER: <u>Dart Aerospace</u>	PO NUMBER: <u>P017601</u>
DATE MATERIAL RECEIVED: <u>8/8/2012</u>	METLAB QUOTE NUMBER: <u>N/A</u> Or, MINIMUM STD ORDER(CHECK) _____
ESTIMATED SHIP DATE: <u>8/15/12</u>	METLAB S.O. NUMBER: <u>73369</u>

THANK YOU FOR YOUR ORDER. WE WILL MAKE OUR BEST EFFORT TO SHIP YOUR ORDER ON OR BEFORE THE ESTIMATED SHIP DATE SHOWN ABOVE. IF YOU NEED TO CONTACT US REGARDING THIS ORDER, PLEASE REFERENCE THE METLAB S.O. NUMBER SHOWN ABOVE.

QUOTATION MISSING? ☒ OK TO PROCESS WITHOUT Dk

PURCHASE ORDER MISSING? _____ OK TO START PROCESSING WITHOUT _____

NOTE THAT WE NEED THE FOLLOWING INFORMATION IN ORDER TO COMPLETE YOUR ORDER AND TO MEET THE PROMISED SHIP DATE:

TECHNICAL INFORMATION REQUIRED(LIST) : _____ ON HOLD : YES _____ NO _____

OTHER INFORMATION OR CLARIFICATION: _____ ON HOLD : YES _____ NO _____

RELEASED FOR PROCESSING BY: Dan DATE: 8/8/12

ACKNOWLEDGED BY: _____

TODAY'S DATE: _____

SHIPPED DATE: _____

THIS ORDER IS ACKNOWLEDGED WITH THE UNDERSTANDING THAT THE ABOVE PURCHASE ORDER IS IN ACCORDANCE WITH METLAB'S TERMS AND CONDITIONS OF SALE AS SUBMITTED AT THE TIME OF THE ABOVE QUOTATION.



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO17601**

Purchase Order Date 8/2/2012

PO Print Date 8/2/2012

Page Number 1 of 2

Order From :

VU-MET001

METLAB

1000 E. MERMAID LANE

WYNDMOOR, PA 19038

USA

Contact Name

Vendor Phone

215-233-2600

Vendor Fax

215-233-5653

Vendor Account Nbr

Buyer

Brigitte Golden

Requisition Nbr

Tax Resale Nbr

10127-2607

Terms

Net 30

Currency

USD

FOB

Destination-Collect

Ship To :

DART AEROSPACE LTD

1270 ABERDEEN

HAWKESBURY, ON K6A 1K7

CANADA

Line Nbr	Reference Revision ID Vendor Part Number	Description/ Mfg ID	Req Date/ Taxable	Req Qty/ Unit of Measure	Ship Method	Unit Price	Extended Price
1	86987 ✓	D350-748-241TRN Crosstube	8/13/2012	1.00	Day & Ross ppd	\$205.0000	\$205.00
			Yes				
		Special Inst:	HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMS 2759-1C) SAND BALST TUBE AFTER HEAT TREAT CERTIFICATIONS				
2	86988 ✓	D350-748-241TRN Crosstube	8/13/2012	1.00	Day & Ross ppd	\$205.0000	\$205.00
			Yes				
		Special Inst:	SAME AS ABOVE				
3	84668 ✓	D350-748-241TRN Crosstube	8/13/2012	1.00	Day & Ross ppd	\$205.0000	\$205.00
			Yes				
		Special Inst:	SAME AS ABOVE				

8/12/8-21

No substitution or deviation without
consent.

Certificate of Conformity or Material
Certification required - YES NO

Change Nbr: 1

Change Date: 8/2/2012



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO17601**

Purchase Order Date 8/2/2012

PO Print Date 8/2/2012

Page Number 2 of 2

Order From :

VU-MET001

METLAB
1000 E. MERMAID LANE
WYNDMOOR, PA 19038
USA

Contact Name

Vendor Phone 215-233-2600

Vendor Fax 215-233-5653

Vendor Account Nbr

Buyer

Brigitte Golden

Requisition Nbr

Tax Resale Nbr

10127-2607

Terms

Net 30

Currency

USD

FOB

Destination-Collect

4	84672 ✓	D350-748-241TRN Crosstube	8/13/2012	1.00	Day & Ross ppd	\$205.0000	\$205.00
			Yes				

Special Inst: Same As above

5	84669 ✓	D350-748-241TRN Crosstube	8/13/2012	1.00	Day & Ross ppd	\$205.0000	\$205.00
			Yes				

Special Inst: Same as above

6	84677 ✓	D350-748-241TRN Crosstube	8/13/2012	1.00	Day & Ross ppd	\$205.0000	\$205.00
			Yes				

Special Inst: Same as above

PO Total: \$1,230.00

8/2/2012

Change Nbr: 1

Change Date: 8/2/2012

No substitution or deviation without
consent.
Certificate of Conformity or Material
Certification required - YES NO

Brigitte Golden

From: Mark Podob <mpodob@metlabheattreat.com>
Sent: Thursday, August 02, 2012 10:15 AM
To: Doris Funches; Dan Krackovic; Eugene Roberts
Cc: Brigitte Golden
Subject: FW: New PO17601 from Dart
Attachments: D350-748-241-RevF.pdf; PO17601 Metlab.pdf

Importance: High

New P.O. from Dart.

Mark Podob
Vice President, Marketing and Sales
Metlab
1000 E. Mermaid Lane
Wyndmoor, PA 19038
215-233-2600 Ext. 232
(F) 215-233-5653
mpodob@metlabheattreat.com

This message and any attachments are intended for the individual or entity named above. If you are not the intended recipient, please do not forward, copy, print, use or disclose this communication to others; also please notify the sender replying to this message and then delete it from your system.

From: Brigitte Golden [<mailto:bgolden@dartaero.com>]
Sent: Thursday, August 02, 2012 9:59 AM
To: Mark Podob
Cc: 'Linda Lacelle'
Subject: New PO17601 from Dart
Importance: High

Good Morning Mark!
Please find attached new PO for 6 crosstubes to be heat treated.
They are leaving today with Day & Ross this afternoon, tracking # OTT 19872092

Thank You

Brigitte Golden
Order Processing
DART AEROSPACE Ltd.
1270 Aberdeen Street
Hawkesbury Ontario
Canada K6A 1K7
Tel: (613) 632-5200 Ext 224
Fax: (613) 632-1053
bgolden@dartaero.com



Please consider your environmental responsibility before printing this e-mail

From: Brigitte Golden [<mailto:bgolden@dartaero.com>]
Sent: Friday, July 27, 2012 11:19 AM
To: 'mpodob@metlabheattreat.com'
Cc: 'Linda Lacelle'
Subject: PO17555 from Dart

Please find attached the PO
Thank You

From: Linda Lacelle [<mailto:llacelle@dartaero.com>]
Sent: Thursday, July 26, 2012 2:36 PM
To: mpodob@metlabheattreat.com
Cc: Brigitte Golden
Subject: more tubes

Hi Mark,

We will be shipping out 9 tubes tomorrow for heat treat. Another batch should follow end of next week. As always, I need these asap..

Thx!

Linda Lacelle
Production manager
Dart Aerospace



Commercial Invoice:145

Ship From: Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Canada
Tel # 1.613.632.5200
GST # RT101272607

Ship To: METLAB
1000 E Mermaid LN
Wyndmoor
PA, 19038 US

ATTN: Mark Podob
PH# 215 233 2600

Date: 2-Aug-12 **P.O. #** 17555

Broker: UPS SCS
PH#: 800 443-6379

Ship Via: Day & Ross PPD **FOB:Origin**

Item	Part Number / Product Description	Tariff Class.	Quantity	Unit Price	Total
1	Crosstube D350-748-241	8803.20	6	\$ 1,250.00	\$ 7,500.0
2					
3					
4					

All Prices are in US Dollars

All of the above parts were made in Canada unless otherwise indicated

THIS IS A CUSTOMS INVOICE ONLY

Sub Total \$7,500.00

Total \$7,500.00

Amount Due: \$7,500.00

Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Canada
Tel.: 1.613.632.5200
Fax: 1.613.632.1185
GST # RT101272607



STRAIGHT BILL OF LADING - 1.866.DAY.ROSS

OTT 1987209.2



NIR R-500048-5

BILLER INIT. INITIALES PROPOSÉES À LA FACTURATION	OFF UNIT DÉCHARGÉ DU VÉHICULE NO.	NO. OF PIECES QUANTITÉ DE MORCEAUX	UNIT UNITÉ
DAY & ROSS	ON UNIT CHARGÉ DANS VÉHICULE NO.	NO. OF PIECES QUANTITÉ DE MORCEAUX	UNIT UNITÉ

DATE MONTH DAY YEAR 08 2 12	LEVEL OF SERVICE <input type="checkbox"/> GENERAL	C.O.D. AMOUNT CURRENCY: <input type="checkbox"/> CDN <input type="checkbox"/> U.S.	Pick Up Information Telephone Number: _____ Contact Name: _____ Ready Date & Time: _____ Closing Time: _____
<input type="checkbox"/> PRIVATE RESIDENCE PICK UP <input type="checkbox"/> PRIVATE RESIDENCE DELIVERY <input type="checkbox"/> PALLETS BEING RETURNED <input type="checkbox"/> HAZARDOUS GOODS* <input type="checkbox"/> APPOINTMENT DELIVERY (DATE/TIME)	<input type="checkbox"/> TAILGATE PICK-UP <input type="checkbox"/> HEATED SERVICE <input type="checkbox"/> TRADE SHOW PU <input type="checkbox"/> INBOND	<input type="checkbox"/> TAILGATE DELIVERY <input type="checkbox"/> TEMPERATURE CONTROL (TL ONLY) <input type="checkbox"/> TRADE SHOW DELIVERY	REQUESTED BY: <input type="checkbox"/> SHIPPER <input type="checkbox"/> CONSIGNEE <input type="checkbox"/> BILL TO <input type="checkbox"/> THIRD PARTY EMAIL: _____

*this shipment contains dangerous goods as set out in the attached shipper's declaration

SHIPPER DAY & ROSS ACCT. NO. 038326 TEL NO. 613 632 5200 SHIPPER'S NAME DART AEROSPACE PICK UP ADDRESS 1270 Aberdeen St HAWKESBURY ON K4A 1K7 CITY PROV. COUNTRY POSTAL CODE	CONSIGNEE DAY & ROSS ACCT. NO. _____ TEL NO. 215 233 CONSIGNEE'S NAME Metlap DELIVERY ADDRESS Mark Podob 1000 E. Mermaid Ln WYNDMOOR PA 190 CITY PROV. COUNTRY POSTAL CODE
--	--

METHOD OF PAYMENT	
<input checked="" type="checkbox"/> PREPAID	<input type="checkbox"/> COLLECT
<input type="checkbox"/> CASH IN ADVANCE	AMOUNT _____ CURRENCY: <input type="checkbox"/> CDN
<input type="checkbox"/> THIRD PARTY BILL TO	ACCOUNT NUMBER _____
<input type="checkbox"/> VISA <input type="checkbox"/> M.C. <input type="checkbox"/> AMX	EXPIRY DATE _____
CARD NO. _____	

OTHER BILL TO PARTICULARS	
BILL TO: _____	
BILL TO ADDRESS _____	

GST: _____	
CITY	PROV. COUNTRY POSTAL CODE

SPOT QUOTE NO.	ROUTING OR SPECIAL INSTRUCTIONS	MAXIMUM LIABILITY OF \$2.00/LB OR \$4.41/KG COMPUTED ON THE TOTAL ACTUAL WEIGHT UNLESS DECLARED VALUATION STATES OTHERWISE. PLEASE SEE ADDITIONAL TERMS AND CONDITIONS ON REVERSE.		
NO. OF PCS.	DESCRIPTION OF ARTICLES AND SPECIAL MARKS	WEIGHT <input checked="" type="checkbox"/> LBS <input type="checkbox"/> KGS	DECLARED VALUE <input type="checkbox"/> CDN. <input type="checkbox"/> U.S.	DIMENSIONS
3	Aircraft Parts CROSS TUBE cardboard cartons	180		127x13x7
ALL USED HOUSEHOLD GOODS AND PERSONAL EFFECTS SHIPPED AT SHIPPER'S RISK OF DAMAGE				

The uniform TERMS OF CARRIAGE apply to this BILL OF LADING. (See Term and Condition No. 1)

NOTICE OF CLAIM must be submitted in writing within sixty (60) days of delivery. (See Term and Condition No. 2)

The carrier's maximum liability is limited by the TERMS CONDITIONS of the Bill of Lading. (See Term and Condition No. 3)

SHIPPER'S REF. NO.	PO 17401
SHIPPER'S SIGNATURE	Brigitte Golden
PRINT	BRIGITTE Golden

PICK-UP DATE	08-02-2012	NO. OF PCS.	
DAY & ROSS DRIVER	Dennis	PURCHASE ORDER	
POWER NO.	270604	TRAILER NO.	1

Manufacturing Inc.

Packing Slip

772 MAIN STREET E., P.O. BOX 3,
HAWKESBURY, ONTARIO K6A 2R4

TEL: (613) 632-0921
FAX: (613) 632-2681

Date Sep 24, 2012	Page 1
Shipment Number SH005312	

Sold To:

DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7
CANADA

Ship To:

DART AEROSPACE
1270 ABERDEEN STREET
HAWKESBURY, ON K6A 1K7
CANADA

Invoice No. 100	PO Number 17979	Customer No. DAR100	Order No. OR005146	Ship Via	Order Date September 24, 2012
--------------------	--------------------	------------------------	-----------------------	----------	----------------------------------

Item Number	Description	Qty. Ordered	UOM	Qty. Shipped	Qty. Backord.
MS-12.7	DART AEROSPACE - SANDBLAST 9 PIPES	9.00	EA	9.00	0.00

Customer:

Total weight:

Prepared:

Total packages:

*** THANK YOU FOR YOUR BUSINESS ***

